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ASSISTANT COMMISSIONER FOR PATENTS
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Re: Serial No.: 09/926,519
Applicant(s): ETIENNE DEGAND, ET AL.
Filing Date: NOVEMBER 30, 2001
For: AUTOMOTIVE GLAZING PANEL WITH SOLAR CONTROL COATING COMPRISING A DATA TRANSMISSION WINDOW
Group Art Unit: 3742
Examiner: JOHN A. JEFFERY

SIR:

Attached hereto for filing are the following papers:

FEE TRANSMITTAL
REQUEST FOR EXTENSION OF TIME (1 month)
APPELLANTS BRIEF ON APPEAL (in triplicate)
EXHIBIT A (Translation of DE 3708577 Claims and Specification)

Our check in the amount of $ 440.00 is attached covering any required fees. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R. 1.136 for any necessary extension of time to make the filing of the attached documents timely, please charge or credit the difference to Deposit Account No. 50-1442. Further, if these papers are not considered timely filed, then a request is hereby made under 37 C.F.R. 1.136 for the necessary extension of time. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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DOCKET NO. 4004-025-30

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: Etienne DEGAND, et al. ART UNIT: 3742

SERIAL NO.: 09/926,519 EXAMINER: John A. Jeffery

FILING DATE: November 30, 2001

FOR: AUTOMOTIVE GLAZING PANEL WITH SOLAR CONTROL COATING COMPRISING A DATA TRANSMISSION WINDOW

APPELLANTS' BRIEF ON APPEAL UNDER 37 CFR 1.192

ASSISTANT COMMISSIONER FOR PATENTS
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SIR:

This is an Appeal from the decision of the Primary Examiner mailed August 27, 2003. In accordance with 37 CFR 1.192, this Brief, along with the Appendix, is filed in triplicate and is accompanied by the required fee.

I. REAL PARTY IN INTEREST

The real party in interest is the Assignee of the above-captioned application, Glaverbel.

II. RELATED APPEALS AND INTERFERENCES

There are no appeals or interferences which will be directly affected by, will directly affect, or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 8, 11, 12, and 14-17 are currently pending.

The Final Rejection of Claims 8, 11, 12, and 14-17 is appealed and the appealed claims are set forth in the attached Appendix.

IV. STATUS OF AMENDMENTS

No amendments have been made subsequent to 23 July 2003. The Notice of Appeal was timely filed February 19, 2004. The Final Office Action is currently being appealed.

V. SUMMARY OF THE INVENTION

The invention relates to a an automotive glazing panel having an electrically heatable solar control coating layer, spaced apart first and second bus bars which relay electrical power to the coating layer (e.g., for defrosting/de-icing the panel) and a data transmission window (e.g., for automatic toll payments).

VI. ISSUES

The issues in this Appeal are the patentability of the claims under the proper evaluation of the facts and proper application of the law pursuant to 35 U.S.C. § 103. An important part of this inquiry is whether the Final Rejection (a) properly interprets the claims, (b) properly interprets the references, and (c) properly combines the references in those instances where the rejection is based on a combination of references.

VII. GROUPING OF CLAIMS

Claims 8, 11, 12, 14 and 16 are considered as a first group. Claim 8 is representative for this purpose.

Claims 15 and 17 are considered as a second group and Claim 15 is representative for this purpose.

VIII. STATEMENT OF THE ARGUMENT

A. Overview

Appellants respectfully disagree with the Final Rejection of the claims. As will be pointed out in greater detail, the Final Rejection does not address many features of the claims, nor does the Final Rejection fully address the inquiry required under 35 U.S.C. § 103.

B. The Rejection of Claims 8, 11, 12, 14 and 16 Under 35 U.S.C. § 103 Based on DE 3708577 Should Be Reversed

These Claims, which are identified as the first group, were rejected based on DE 3708577 without any analysis of differences between any of the claims as a whole and the prior art, or the level of ordinary skill in the art.

A prior version of these Claims were rejection under 35 U.S.C. § 102 based upon this same reference in the Official Action of 24 April, 2003. In response, Appellants amended these claims, inter alia, to recite a windscreen. Previously, the claims encompassed a glazing and thus encompassed, inter alia, a rear window (also known as a backlite) for a vehicle.

Against this background, the entire rejection should be considered. The entire rejection is:

> DE 3708577 discloses a heated windshield with a plurality of uncoated regions 8 surrounded by an electrically heated coating 6. Because the uncoated regions are devoid of any metallic material (that would potentially shield electromagnetic radiation), the uncoated regions would inherently permit the passage of electromagnetic signals (i.e., data) therethrough. According to the abstract, such a pattern permits "adequate transmission...as well as adequate reflection of infra-red radiation." Thus, the coating functions as an electrically heatable "solar control" coating. Note also the abstract which characterizes the coating as "electrically conducting" and "heat reflective". Regarding the disposition of the "data transmission window" "adjacent" the top or bottom edge of the glazing panel, the

scope and breadth of the term "adjacent" did not preclude the relative proximity of the uncoated regions to the panel edges of DE 3708577. (emphases added)

The analysis of the DE '577 document in incorrect in several regards. First, the document does not disclose a windscreen. (If it did, then the rejection would have again been based on 35 U.S.C. § 102). In fact, the Abstract does not say windscreen. Appellants enclose a translation of the Claims and specification. At no time is there a reference to a windscreen or what might be referred to as a front windshield. (The word 'windscreen' does appear in one of the "Derwent" translations of the abstract, but this is clearly in error.) In fact, an objective reading of this document leads to the inescapable conclusion that the device is for a "rear window" and the device is what is commonly referred to in the U.S. as a rear-window defroster or rear-window defogger. The Final Rejection inherently concedes this fact by switching the basis of the rejection from § 102 to § 103 (of 35 U.S.C.).

It is illogical to consider the DE '577 document as anything other than a rear window device. The device is illustrated as having a substantial portion of a field of vision impaired by the electrically conductive layer. The Abstract indicates that there is less than 20% transmission coefficient, , i.e. a luminous transmittance (TL) of 20%, except for the uncoated portions which have a transmission of at least 40%. In order to conform to U.S. standards, a windshield must have a TL of at least 70%. It is unimaginable to suggest that a grid structure as in the DE '577 document which is clearly in the zone of vision through the glass, would be for anything other than for a rear window/backlite.

Second, the DE '577 publication does not disclose a "solar control coating layer" as set forth in the Claims. A solar control coating layer is described in the instant specification at page 1, lines 29-34 in the following language:

The term solar control coating layer as used herein refers to a coating layer which increases the selectivity of the glazing panel, i.e. the ratio of the proportion

> of incident visible radiation transmitted through the glazing to the proportion of incident solar energy transmitted through the glazing. Many solar control coating layers have the intrinsic property of being electrically heatable.

Nothing in the DE '577 document suggests any such solar control coating layer. While the Final Rejection refers to the "electrically heated coating 6" as such a solar control coating layer, as noted above in the emphasized portions of the Final Rejection, there is no such teaching in the DE '577 document. Where, in the DE '577 document, is there any indication of an increase in selectivity of the glazing panel based upon such a layer? There is none. Since the definition of the term "solar control coating layer" is explicit in the present specification, it can not be ignored in an effort to create a rejection.

Finally, Appellants' Claims include the provision of a data transmission window. The Final Rejection argues that any uncoated portion of a glazing panel would permit transmission of electromagnetic data therethrough. Claim 8 indicates that the data transmission window is positioned adjacent to the top edge or bottom edge of the glazing panel. In the DE '577 document, assuming arguendo that the spaces 8 in the grid could, in fact, constitute such data transmission windows, there are elongated strips 4, 5 adjacent the top and bottom edge of the glazing panel. The grid-like structure is in the center of the glazing panel and thus, by definition, if one of the openings 8 were construed to be a data transmission window, it would be adjacent the coating strips, 4, 5 but not adjacent the top or bottom edge of the glazing panel.

Against this background, it is incorrect to interpret the DE '577 publication as (a) being a windscreen, or (b) having a solar control coating layer, or (c) having a data transmission window adjacent the top or bottom edge of the windscreen.

Finally, with respect to the substance of the Final Rejection, at page 5, third full paragraph, the Final Rejection attempts to discount or ignore the term "windscreen" in the Claims by reference to Appellants' own specification at page 5, lines 13 – 15 which state:

> Whilst the invention has been particularly described in relation to a windscreen it will be understood that it is applicable to other automotive glazing panels, for example, side windows, rear windows and sunroofs.

It is submitted that the Final Rejection is improperly using Appellants' own teachings against them. There is no teaching in the prior art that the rear window disclosed in DE '577 could be utilized in windscreens, side windows, rear windows and sunroofs. Rather, Appellants suggest that their particular invention (which is now claimed in respect of windscreens) may by applicable to other automotive glazing panels. It is submitted that it is improper for the Final Rejection to twist this language into some sort of concession that the use of the term "windscreen" in the Claim is not critical and thus not entitled to any weight. Indeed, if not entitled to any weight, then there was no basis to switch from a rejection based on § 102 to a rejection based on § 103.

In addition to being substantively improper, the Final Rejection is procedurally improper. The Final Rejection does not indicate any "differences" between any claim in this first group and the '577 reference, yet the Final Rejection is predicated on 35 U.S.C. § 103. The Final Rejection does not state anything about the level of skill, etc. Neither the English language Abstract nor the Final Rejection explain the function of portions 6 and 7 in the reference. Are these the bus bars? If so, then what is the function of portions 4 and 5, since they are separated by channels 2 and 3 from sections 6 and 7. The analysis of the reference in the Final Rejection is submitted to be incomplete at best.

The grid of perforations is intended to increase light transmission. While some electromagnetic radiation (i.e., "data") may pass through the perforations, there is no teaching of this in the reference, and no teaching such that Appellants' claimed invention is rendered obvious. Why would someone looking at this reference, which provides the grid of perforations for the disclosed purpose of increased light transmission, reach the conclusion, without the

benefit of hindsight, that one or more of the grids could be used as an electromagnetic data transmission window? This prior art does not recognize the problem recognized and solved by Appellants. The reference teaches nothing about the need for a data transmission window.

For each of the foregoing reasons, the Final Rejection of the first group of claims based on the DE '577 reference is improper and incorrect and should be reversed.

C. The Rejection of Claims 8, 11, 12, 14 and 16 Under 35 U.S.C. § 103 Based on FR 2737075 in view of EP 378917 Should Be Reversed

These are the same Claims which have been rejected based upon DE '577 referred to in Section VIII B of this Brief.

The Final Rejection argues that FR '075 discloses data transmission windows, namely, the uncoated regions between coated strips 4. The Final Rejection concedes that FR '075 does not expressly indicate the heater coating to be a solar control coating layer, but urges that the use of such coatings as electric heater coatings for heating windshields is conventional (citing EP '917) and citing Appellants' specification at Page 1, lines 23-35 to the effect that "electric heating layers with solar control properties are well known in the art to reduce overheating of the vehicle interior in summer".

The Final Rejection is incorrect in several respects. First, FR '075 does not even disclose a windscreen, but rather a backlite. The fourth paragraph in the description in FR '075 (commencing with the language "Il est connu de disposer...") is translated as:

> It is known to provide the glazing surface with electroconductors and to design a zone in which their resistance is lower, to concentrate the heating in said zone and to allow an acceptable back vision with the inside rear-view mirror.

That language confirms that FR '075 refers to a backlight or rear window. Similarly the eighth and tenth paragraphs of the French Description ("Selon l'invention..." and "Sur le vitrage..." are translated as:

According to the invention, the electroconductors, respectively placed in the preferential zone of vision, are deposited on a screen formed by an insulating enamel of uniform thickness slightly greater than the one of said conductors.

So, on the glazing panel, the electroconductors network may be realized by depositing a conductive paste on the insulating enamel.

This indicates that the backlite carries electro-conducting bands which are made by silk screen printing by depositing a conductive paste on the non-conductive enamel.

The FR '075 document is not a windscreen. The use of non-conductive enamel and conductive paste indicates incompatibility with the vision required of a windscreen. This document relates to a backlite.

Second, the use of non-conductive paste does not suggest a solar control coating layer at all, let alone a solar control coating layer as defined previously.

Third, why, without hindsight, would a person of ordinary skill even look to the EP '917 document? In other words, what is the motivation from the FR '075 document to look any further? None has been identified in the Final Rejection. It certainly would not be the desire for a solar control layer (i.e., increased selectivity) as there is nothing in the FR '075 document which identifies any problem with the opto-energy properties of a backlite.

Finally, Appellants' prior remarks about the absence of a data transmission window in DE '577 are equally applicable to the absence of such a data transmission window in FR '075.

The rejection in this regard is both improper and incorrect – incorrect as to the interpretation of the prior art and improper in not establishing a prima facie basis to combine the teachings of the prior art.

The teachings of FR '075 can not be combined with either EP '917 or Appellants' specification, without the benefit of hindsight, to allegedly render the claimed invention obvious. For example, based on EP '917, the entire window would be coated with a solar control coating and there would be no data transmission window. Appellants' specification at Page 1, lines 23-35 (the portion cited in the Final Rejection) also refers to the solar control coating but then describes the problem which Appellants solve, namely, the need for a data transmission window. In fact, Appellants' own specification cites the EP document.

The Final Rejection has improperly equated Appellants' description of the use of a solar control coating as described in the EP document (Page 1, lines 17-28) with Appellants' identification of the problem with such a coating (Page 1, lines 29-35).

What is missing from the Final Rejection in this regard, among other things, is a recognition that, for example, the entire glazing panel should not be provided with a solar coating, for example, that a portion may remain uncoated to provide a data transmission window. To suggest that once the decision is made to provide a data transmission window "it would have been obvious" to have, for example, a portion of the glazing panel uncoated is nothing more than impermissible hindsight. This approach presumes that Appellants' invention (including recognition of the problem and provision of a solution) is in the prior art, and then (not surprisingly) "finds" the necessary teachings by combining the prior art with Appellants' own disclosure.

As a consequence of the improper reading of Appellants' specification, the rejection is improper since combination of FR '075 with a solar control coating would not result in a data transmission window at all, let alone such a data transmission window adjacent to either the top edge or the bottom edge of the glazing panel and also such an invention where (a) the first bus bar is arranged substantially adjacent to and extends substantially along the first edge of the

glazing panel, and (b) the second bus bar is arranged substantially adjacent to and extends substantially along the second edge of the glazing panel.

Furthermore, the combination of the disclosures of FR '075 and EP '917 has no technical logic; if it is desired to have a heatable glazing panel, the skilled addressee, or person of ordinary skill in the art, has a choice between using either a continuous transparent heatable coating of the type described in EP '917 or a grid of opaque silver paste of the type described in FR '075.

Similarly, the Final Rejection is erroneous as a matter of law and, in addition, misreads and improperly relies on Page 5, lines 13-15 of the present specification. (See, Final Rejection, page 4, last sentence of paragraph bridging pages 3 and 4.) First, the legal error, is the statement in the Final Rejection "Regarding the windscreen limitation recited in the preamble, the examiner finds no criticality in the panel being used as a windscreen in lieu of a rear window." As a matter of law, all words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970) There is no exception under which only "critical" words need by considered. Second, reliance on Appellants' detailed description at page 5, lines 13-15 would be incorrect because those words are not a statement of prior art but rather a statement of Appellants' own contribution.

Again, for each of the foregoing reasons, the Final Rejection of the Claims based upon the combination of FR '075 and EP '917 should be reversed.

D. The Rejection of Claims 15 and 17 Under 35 U.S.C. § 103 Based on Various Documents Combined with Sperbeck is Improper and Should be Reversed.

Claims 15 and 17 were rejected as obvious based on either (a) FR '075 plus EP '917 and Sperbeck, U.S. 5354966 or (b) DE '577 and Sperbeck. Claim 15 is representative and adds that the "heat dissipation is controlled substantially evenly over a majority of the surface area of the glazing panel".

First, the rejection can not be maintained because Claim 15 depends indirectly (via Claim 14) from Claim 8, and the rejection of Claim 8 has been shown to be improper.

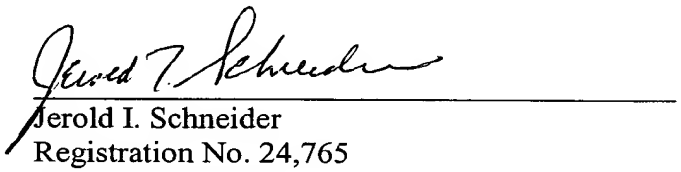
Second, the rejection can not be maintained because of the "Sperbeck" '966 reference itself. Sperbeck '966 refers at column 1, lines 22-25, to a rear window defogger. This is part of the "Background" portion of the Sperbeck document. Thereafter, Sperbeck refers only to window defoggers. Thus Sperbeck is ambiguous, as best, as to whether the disclosure is intended to refer to a window defogger for a windscreen (windshield) or only a backlite (rear window). But the rejection relies on the "Background" portion of Sperbeck '966 which identifies the desire of uniform heating (of a window defogger) and suggest (a) increasing power to the bus bars or (b) accepting the fact that a portion of the window may not be defogged. Sperbeck then indicates that the second alternative is unsatisfactory. No other part of the Sperbeck document is relied upon in the Final Rejection. (Col. 1, line 55 through Col. 2, line 12). But how does Sperbeck actually achieve (or allegedly achieve) the objective? Sperbeck relies on an optically clear covering including ITO (indium tin oxide) and multiple layers of silver printed on the ITO, with the silver functioning as bus bars, and with additional details of a power supply housing and its location. (See, Sperbeck, Col. 2, lines 18-47). Now that we know how Sperbeck allegedly achieves the objective, what part(s) of the Sperbeck teaching is (are) properly combinable with the other prior art relied upon in the rejection? The Final Rejection leaves this to conjecture. Certainly the Final Rejection does not suggest an additional layer (an optically clear coating with ITO) on the coated glazing for to do so, without additional disclosure, leaves one to guess as to what impact this would have on (a) the data transmission window or (b) the solar control features. The Final Rejection does not suggest printing silver bus bars or locating a power supply housing in a particular location.

Absent some showing as to what the reference teaches, including how the reference achieves its objectives, and how that teaching is combinable with other prior art, it is improper to merely quote a paragraph from a reference and conclude *ipso facto* that the reference has something combinable with the other references of record. There is no explanation in the Final Rejection as to whether the teaching in the Sperbeck reference would interfere with the teachings of the other references, or how the other references would be purportedly 'modified' or 'combined' with the Sperbeck reference.

For each of these reasons, it is submitted that this rejection can not be maintained.

IX. CONCLUSION

It is respectfully submitted that the Final Rejection is factually incorrect, procedurally improper, and legally incorrect. The Final Rejection should be reversed in all respects.



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CLAIM APPENDIX

1-7 (Canceled)

8. (Previously Presented) An automotive windscreen glazing panel in which the glazing panel perimeter comprises at least a top edge, a bottom edge and first and second side edges, the bottom edge being longer than the top edge and substantially parallel thereto and each of the side edges being substantially the same length as each other and shorter than the top edge,

in which the glazing panel is provided with an electrically heatable solar control coating layer over at least part of its surface area,

in which the glazing panel is provided with a data transmission window adapted to permit electromagnetic data transmission therethrough,

in which the data transmission window permits transmission of a greater proportion of incident electromagnetic data than the proportion of incident electromagnetic data transmitted by an equivalently sized portion of the glazing panel provided with the solar control coating,

in which the data transmission window is at least in part surrounded by the coating layer and is positioned adjacent to either the top edge or the bottom edge of the glazing panel,

in which the first bus bar is arranged substantially adjacent to and extends substantially along the first edge of the glazing panel;

in which the second bus bar is arranged substantially adjacent to and extends substantially along the second side edge of the glazing panel.

9-10 (Canceled)

11. (Previously Presented) An automotive windscreen glazing panel having

an electrically heatable solar control coating layer;

spaced first and second bus bars adapted to relay electrical power to the coating layer;

a data transmission window;

the first bus bar positioned adjacent a first side edge of the glazing panel;

the second bus bar positioned adjacent a second side edge of the glazing panel; and one of the following:

(a) the data transmission window is positioned adjacent the tope edge of the glazing panel;

(b) the data transmission window is positioned adjacent the bottom edge of the glazing panel.

12. (Previously Presented) The automotive glazing panel in accordance with Claim 11 and further including at least one of the following:

(c) the data transmission window is substantially elongate in shape with its elongation stretching substantially parallel to the top edge of the glazing panel;

(d) the data transmission window is substantially elongate in shape with its elongation stretching substantially parallel to the bottom edge of the glazing panel;

(e) the data transmission window is at least partially surrounded by the coating layer;

(f) the data transmission window is substantially surrounded by the coating layer;

(g) the minimum distance between the periphery of the data transmission window and either of the first bus bar or second bus bar is at least 300 mm.

13. (Previously Presented) The automotive glazing panel in accordance with Claim 11 in which the glazing panel is an automotive windscreen.

14. (Previously Presented) A method of controlling heat dissipation over at least a part of the surface area of an automotive glazing panel comprising providing a glazing panel made in accordance with Claim 8.

15. (Previously Presented) A method in accordance with Claim 14 in which the heat dissipation is controlled substantially evenly over a majority of the surface area of the glazing

panel.

16. (Previously Presented) A method of controlling heat dissipation over at least a part of the surface area of an automotive glazing panel comprising providing a glazing panel made in accordance with Claim 11.

17. (Previously Presented) A method in accordance with Claim 16 in which the heat dissipation is controlled substantially evenly over a majority of the surface area of the glazing panel.

Patent Claims:

1. Glass sheet, in particular automotive glass sheet, with a layer, which is electrically conductive and reflects heat rays, characterised in that the electrically conductive layer has a low surface resistivity of less than 2 ohm per square unit and a low light transmission of less than 20%, and that this layer is provided in at least one selected region with regularly arranged interruptions such that the light transmission in this region is increased to at least about 40% by the formation of a grid-like or strip-like structure, whereas at the same time the low surface resistivity is retained or not impermissibly increased.

2. Glass sheet according to Claim 1, characterised in that the grid-like or strip-like structure is configured in the manner of a grating or net screen.

3. Glass sheet according to Claim 1 or 2, characterised in that the selected region with grid-like layered structure is located in the central section of the glass sheet, and that regions (4; 5) with a continuous layer adjoin this region above and below this region.

4. Glass sheet according to one or more of Claims 1 to 3, characterised in that the region with grid-like structure is electrically separated from the adjoining regions with a continuous layer by channel-like layer interruptions (2, 3).

5. Process for the production of a glass sheet according to one of Claims 1 to 4, characterised in that a grid-like structure is deposited by means of a vacuum coating process by covering parts of the glass sheet by a grid screen during deposition of the layer.

6. Process according to Claim 5, characterised in that the grid screen is disposed at a short distance above the glass sheet in the deposition chamber.

7. Process according to Claim 5, characterised in that the grid screen consists of a sheet of paper or foil, which is applied to the glass sheet and removed again after deposition of the layer.

8. Process for the production of a glass sheet according to one of Claims 1 to 4, characterised in that a continuous, uniform, electrically conductive layer with infrared reflective properties is applied to the glass sheet and then the parts of the layer required for formation of the grid are removed again.

9. Process according to Claim 8, characterised in that the partial removal of the electrically conductive layer is achieved by an etching process.

10. Process according to Claim 8, characterised in that the partial removal of the electrically conductive layer is achieved by means of a laser beam.

Description

The invention relates to a glass sheet, in particular an automotive glass sheet, with a layer, which is electrically conductive and reflects heat rays.

Glass sheets with an electrically conductive surface coating are known in many configurations. A fundamental problem with all the known configurations is that to achieve a low surface resistivity of the layer, the layer has to be so thick that the transmittance in the visible light range is very low and is consequently inadequate for many purposes, e.g. for use as electrically heated glass sheets for automobiles.

While it is possible to also produce electrically heated glass sheets for automobiles with correspondingly high transmittance, i.e. correspondingly thin conductive layers, the surface resistivity is then so high that such heated glass sheets cannot be operated at the voltage of 12 volts available in the vehicle, but require a substantially higher voltage. While electric voltages of up to 48 volts are permitted in motor vehicles, such increased electric voltages require an additional power expenditure, which is associated with quite considerable additional costs.

It is also known and usual to produce electrically heated automotive glass sheets with a low operating voltage so that narrow heat conductors made in particular of a stoving compound or enamel containing metal particles are disposed and baked on a surface of the glass sheet. However, such heated sheets cannot fulfil the function of solar protection glasses, as is achieved by heated sheets with continuous surface layers.

The object forming the basis of the invention is to provide a glass sheet, in particular for use in a motor vehicle, which is provided with a layer that is electrically conductive and reflective to heat rays, and which, on the one hand, because of its partially reflective properties, results in a substantial reduction in the heat energy radiated in, and, on the other hand, at the same time has a transmittance in keeping with regulations, at least in sections, and a sufficiently low surface resistivity, so that it can be operated with the usual electric voltages permitted in motor vehicles.

Working from a glass sheet provided with an electrically conductive surface layer, which is reflective to infrared rays, said object is achieved according to the invention in that the electrically conductive layer has a low surface resistivity of less than 2 ohm/square unit and a low light transmission of less than 20%, and that this layer is provided in at least one selected region with regular interruptions such that the light transmission in this region is increased to at least about 40% by the formation of a grid-like or strip-like structure, whereas at the same time the low surface resistivity is retained or not impermissibly increased.-

Thus, through the invention, the transmission of the glass sheet is purposefully increased by the complete removal of the conductive layer in some regions, while the remaining regions of the conductive layer retain the conductivity necessary for the overall heating capacity. The configuration of the conductive layer as a uniform grid at the same time results in the thermal protection effect of the glass sheet being retained to an adequate degree in this selected region.

The structure of electrically conductive and infrared-reflective layers, in particular multiple layers, as well as processes for applying such multiple layers are known as such and are not the subject of the invention.

The invention may be performed, for example, with thin conductive layers, which are applied using a vacuum deposition process, in particular using the cathodic sputtering process, wherein silver is used in particular for the metal conductive layer. If deposited silver layers are to have a heating capacity of 3 to 4 watt/dm^3 with a dc voltage of 12 volts, the thickness of the metal conductive layer must amount to about 0.5 to 1 micrometre. With this layer thickness, however, the transmission in the visible light range only amounts to a few per cent. By forming a suitable grid of the silver layer in such a manner that about 40%, for example, of the area of the silver layer in grid form is subsequently removed in the selected viewing field, or instead of this a grid-shaped deposit of the silver layer is assured during application of the silver layer by a corresponding grid-shaped covering of the glass sheet, then the transmission can be increased to a transmittance corresponding to the proportion of the area not coated. At the same time, the electrical conductivity remains at a value necessary for the desired heating capacity.

In order to apply a grid-shaped layer as such on the glass sheet, the parts of the glass surface to be kept free of the layer can be covered, for example, during deposition of the layer, i.e. either by means of a suitable grid screen, which is arranged between the coating cathode and the glass surface, or by an appropriate grid foil, which is applied to the glass sheet and removed after deposition of the conductive layer.

Another possibility for formation of such a grid is, as already mentioned, to firstly apply a uniform continuous layer and to remove parts of the layer again later. The part-removal of the layer can be performed by chemical means, e.g. by a suitable etching process, or also by mechanical means, e.g. using a laser beam.

A practical example of the invention is described in more detail on the basis of Figure 1, which shows a view of a rear wall automobile window configured according to the invention.

The automotive glass sheet 1 can be a monolithic glass sheet, i.e. a single-sheet safety glass sheet, or a multilayer glass sheet, i.e. a composite safety glass sheet. In the case of a single-sheet safety glass sheet, the electrically conductive and infrared-reflective layer is disposed on the surface of the glass sheet facing the passenger compartment. In the case of a composite safety glass sheet, the layer is disposed on the inside of the composite glass sheet, i.e. on a surface of one of the individual glass sheets forming the composite glass sheet abutting against the thermoplastic intermediate layer.

The electrically conductive, infrared-reflective layer is divided into various fields. As a result of two narrow channel-like interruptions 2 and 3, which run parallel to the upper edge of the glass sheet or to its lower edge, a strip-like region 4 is formed in the upper region of the glass sheet and a strip-like region 5 is formed in the lower region of the glass sheet. These regions are no longer conductively connected to the central section of the conductive strip as a result of the interruptions 2 and 3.

In the central section, the conductive layer consists of strip-like fields 6 and 7 respectively along the two side edges, in which fields the conductive layer is present as a continuous layer. The layer has a grid-like form between these strip-like lateral

fields 6,7. The strip-like fields 6, 7 at the same time serve as busbars for the power supply to the grid-like layer structure between these fields. The grid is formed by a plurality of uniformly arranged small fields 8 being present in the layer, which in the illustrated case are provided in the form of small squares, in which the electrically conductive reflective layer is removed. As a result of this, only narrow intersecting strips 9 remain of the electrically conductive reflective layer, and these form an electrically conductive network. The surface ratio of the uncoated squares 8 to the electrically conductive strips 9 amounts to about 4:6 in this grid-like central section, so that the transmittance in this central section therefore amounts to at least about 40%.